NASA Procedural Requirements

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CHAPTER 3. Formulating a Technology Commercialization Strategy and Plan

3.1 Planning Overview

3.1.1 This chapter provides guidance to a NASA activity manager for developing an overall technology commercialization strategy and plan. For those NASA activities for which NPR 7120.5 applies, a "Technology Commercialization Plan" should be prepared as part of the overall program/project plan during its formulation phase- Sections 2.1.4 and 3.1.4 of NPR 7120.5 provide additional guidance on preparing this plan. Basically, the plan describes how the activity will implement the technology commercialization process. The plan's "robustness" will be determined by the activity's commercial potential (i.e., the activity's expected technological assets, their projected commercial applications, and their potential for partnering). Section 3.3 of this document provides additional guidance on the preparation of a Technology Commercialization Plan.

3.1.2 As specific technological assets are targeted for commercialization, a more detailed Technology Commercialization Plan may be justified. A sample Technology Commercialization Plan format is provided in Appendix A and may be used as a guideline in formulating the plan. The Technology Commercialization Plan shall be written at the outset of a program or project and evolve over time as commercial technology applications and partnership opportunities become more evident. Communication with the Center's Commercial Technology Office (CTO) for developing technology commercialization strategies and plans, is necessary. Each CTO can provide

further guidance and specific examples of Technology Commercialization Plans.

3.2 Determining Commercial Potential

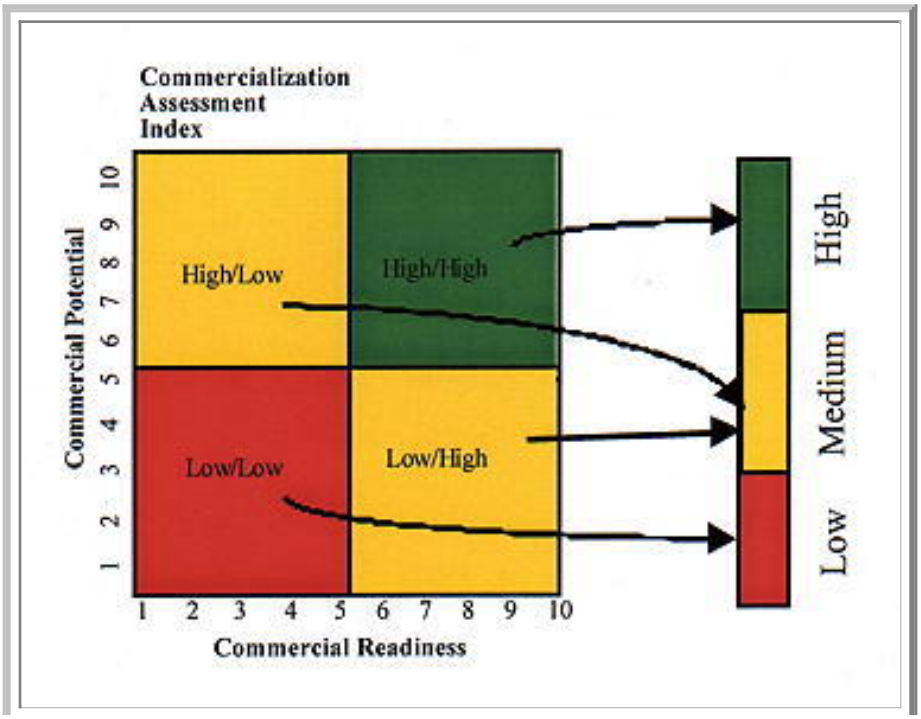
3.2.1 Technology commercialization planning begins with determining the overall commercial potential of a NASA activity's existing or planned technological asset. This, in turn, determines how "robust" the plan and partnering strategy will be. Determining an activity's commercial potential involves three basic assessments performed by the activity manager with assistance from the CTO:

a. The likelihood of the activity yielding innovative technological assets (technologies, innovations, facilities and expertise). Producing innovative technological assets is the minimum criteria for demonstrating commercial potential.

b. The "market readiness" for the technological asset(s). Clearly, the commercialization of a technological asset will be difficult, if not impossible, if the market applications are not clearly evident or are immature.

c. Whether the technological asset's technical maturity can be sufficiently advanced such that the level of risk is acceptable to a commercial technology partnership. This maturity level is likely to be related to, but not the same as, the technology readiness level (TRL) that NASA uses to determine if a technology is ready for insertion into a mission. Rather, this is a "commercialization readiness level" (CRL) that determines if the technology is ready for the market. It is recognized that determining the activity's commercial potential is subjective. The overall likelihood of a successful commercialization (i.e. commercial potential) is determined on a scale of 1 (low) to 10 (high). The likely timeframe (commercial readiness) for this happening is also estimated on a scale of 1 (relatively long-term, i.e., 5+ years) to 10 (short term, i.e., 1 year or less). As Figure 3-1 illustrates, an overall rating can be developed by combining these factors.

Figure 3-1 Commercialization Readiness Level Assessment Index



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Each activity should work closely with its Center's CTO in making a commercialization readiness level determination.

3.2.2 The NASATechTracS Information System is used to track the commercial potential of all NASA activities. Each activity's commercial potential is tracked at the 7-digit, UPN (Unique Project Number) level. A monthly summary is available to all NASA managers (CTOs can place NASA managers on a distribution list). A quarterly summary is provided to the Program Management Council. Chapter 7 provides more information on these summaries. Each Center is responsible for establishing its own internal policy for ensuring that the "commercial potential" status in NASATechTracS is kept current. Each Center's CTO can provide more information and access to this Web-based tool.

3.3 What to include in the Technology Commercialization Plan

3.3.1 Technology commercialization planning should begin as soon as the NASA activity's commercial potential has been determined. For those activities that are governed by NPR 7120.5, the Technology Commercialization Plan shall be developed by the NASA activity manager as part of the overall program/project plan during the formulation phase and submitted for approval to the Governing Program Management Council (GPMC). The guidelines in NPR 1441.1, NASA Records Retention Schedules, should be followed to maintain and safeguard these records.

3.3.2 In general, Technology Commercialization Plans should address how the NASA activity is going to accomplish the following:

a. Promptly identifying and reporting new technologies and innovations as they are realized (see Chapter 4);

b. Developing and implementing commercial technology partnerships (see Chapter 5);

c. Systematically evaluating and reporting on the success of those commercial partnerships (see Chapter 6);

d. Incorporating standard technology commercial performance metrics and indicators into the activity's overall performance management and reporting (see Chapter 7); and

e. Ensuring that all appropriate data is captured in NASATechTracS.

3.4 Commercialization Plans for Technology Focused and Technology Supported Program/Projects

3.4.1. It is generally expected that technology focused and technology supported activities will result in new technological innovations with a strong potential for commercial application, and thus result in more technology commercialization partnerships.

3.4.2. In addition to those factors listed in Paragraph 3.3.2, the Commercialization Plan for technology focused and technology supported programs should provide:

a. An outline of the technology commercialization plan for the activity;

b. A description of the expected technological asset(s) which may result from the activity which could have commercial applicability;

c. Proposed partnership arrangements for commercializing one or more of the activity's assets identified above;

d. A description of how technology commercialization will be incorporated into that activity's technology trade studies. (Incorporating technology commercialization factors into trade studies ensures that the technology's "Commercialization Readiness Level (CRL)" is being specifically considered along with NASA's traditional Technology Readiness Level (TRL)); and

e. A report to the Center's CTO on any success stories that have resulted from its technological assets and partnerships.

The guidelines in NPR 1441.1, NASA Records Retention Schedules, should be followed to maintain and safeguard these records.

3.5 Commercialization Plans for Operations/Support Programs/Projects

These activities programs/projects do not generally include either "technology focused" or "technology supported" activities. Thus, it is not expected that the activity will implement commercial technology partnerships as early in the process as technology focused and technology supported activities. However, because of the often highly technical nature of operations/support activities, technological assets of value to the commercial marketplace often result. Thus, at a minimum, NASA managers of these activities should still develop a Technology Commercialization Plan which emphasizes the prompt reporting and processing of any technological assets developed by the activity. The guidelines in NPR1441.1, NASA Records Retention Schedules, should be followed to maintain and safeguard these records.

3.6 Communication of Commercial Technology Objectives to Contractors and Recipients

3.6.1 Over 80 percent of NASA's R&D resources are allocated, through its procurement process, to its contractors, grantees, and recipients. It is essential, therefore, that contractors, grantees, and recipients fully understand NASA's commitment to technology commercialization.

3.6.2 Based on the type of entity performing the work (i.e., small business, large business, college or university, or nonprofit organization), NASA contractors, grantees, and recipients who develop a technological asset under a NASA activity have, at their option, the right to either elect to retain title to the NASA-funded technology (small business, college or university, or nonprofit organization) or to obtain title to the technology through the NASA waiver process (large business). However, contractors, grantees, and recipients that obtain title to NASA-funded technology through the election or waiver process are required by statute to file patent applications and pursue commercialization, either directly or through a licensee or assignee. Generally, it is in the financial interest of contractors, grantees, or recipients that receive title to a NASA-funded technology to maximize the commercial utilization of the technology either on their own or through a licensee or assignee. NASA activity managers contemplating

commercialization of a technology should consult their Center's Patent Counsel to determine the respective rights of the government and its contractors, grantees, and recipients in NASA-funded technologies (See Appendix B for more details regarding the respective rights of the government and its contractors, grantees and recipients).

3.6.3. Contractors, grantees, and recipients should be encouraged to support, and participate in, NASA's Technology Commercialization Program by assisting in the commercialization of technology developed under NASA procurement contracts, grants, cooperative agreements and Space Act Agreements. In accordance with applicable laws, and with the intellectual property clauses in contracts, grants, and cooperative agreements, contractors, grantees, and recipients are required to report innovations and new technologies developed under government funding. Additionally, intellectual property clauses in contracts, grants, and cooperative agreements with large businesses require the large businesses to establish and maintain active and effective procedures to ensure that new technologies and innovations are promptly identified and disclosed to the government. Although applicable laws provide contractors, grantees, and recipients the option to participate in the commercialization process through the election and waiver processes, they are not required to do so.

However, NASA activity managers should:

a. Encourage contractors, grantees, and recipients to develop internal programs which address:

(1) Educating and training their workforce in technology commercialization activities;

(2) Motivating their employees to report innovations and new technologies in accordance with the New Technology or Patent Rights clauses in their procurement contract, grant, or cooperative agreement; and

(3) Assisting subcontractor(s) with technology commercialization activities.

b. Consider applying the following thrusts in formulating contracts, grants, and cooperative agreements:

(1) Providing performance award fees related specifically to technology commercialization performance; and

(2) Including Technology Commercialization Plans and Technology Commercialization Reports as data deliverables (with a flow down to subcontractors).

3.6.4. Contractor, grantee, and recipient participation in NASA's Technology Commercialization Program may involve a number of different activities, including:

a. Dual-use development of innovative technologies having applications both within and outside the aerospace community;

b. Collaborative efforts and partnerships with third parties for the purpose of commercializing technology;

c. Support to government-sponsored technology outreach and industry assistance programs that further the commercialization of technology; or

d. Application engineering work for the purpose of adapting the developed technology to commercial application(s)

For those activities expected to have commercial potential, a Technology Commercialization Plan should strongly be considered as a Data Requirement Deliverable (DRD) in the solicitation. For guidance purposes, Appendix D provides an example of such a DRD.

3.6.5 Commercialization efforts and partnerships contemplated by NASA and its contractors, grantees, or recipients shall be reviewed by the Center's Commercial Technology Office prior to a formal agreement. Commercialization projects formed under a NASA procurement contract, grant, or cooperative agreement shall be approved in . writing by the Contracting or Grants Officer. Such contracts or agreements shall state funding requirements, project description, scope of project, reporting requirements, and responsible NASA and contractor personnel. Ownership of rights to the technology developed under these collaborative and partnership activities shall be addressed in the individual agreements and shall be in accordance with federal statutes. Projects requiring government funds shall be approved in writing by the Contracting Officer.

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